

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application.

1. (Currently amended) A method for fast converging an end-to-end service, comprising:
setting routing information and tunnel state information for each of at least two tunnels, by
a double-ascription Provider Edge (PE) of a remote Customer Edge (CE) in the double-ascription
PE itself which is connected with a nearby CE, before the nearby CE visits the remote CE,

wherein, ~~an initial node of the tunnels is the double-ascription PE of the remote CE~~
connected with the nearby CE serves as an initial node of each of the at least two tunnels, and at
least two other PEs connected with the remote CE serve as terminal nodes of a terminal node of
~~each of the at least two tunnels, is a PE which is connected with the remote CE respectively, and~~

wherein the routing information and the tunnel state information of the at least two
tunnels are stored in one route forwarding table in an IP network;

detecting, by the double-ascription PE of the remote CE, tunnel states to obtain state
information of the at least two tunnels;

selecting, by the double-ascription PE of the remote CE, one or more available tunnels
according to the state of each tunnel from the at least two tunnels; and

forwarding, by the double-ascription PE of the remote CE, service according to the routing
information of the available tunnels selected.

2. (Previously presented) The method according to Claim 1, wherein, each of the tunnels
comprises an inner layer tunnel and an outer layer tunnel; the inner layer tunnel is a Virtual
Private Network (VPN) tunnel, and the outer layer tunnel is a Label Switching Path (LSP) tunnel

or a Genetic Routing Encapsulation (GRE) tunnel or an Internet Protocol Security (IPSec) tunnel.

3. (Previously presented) The method according to Claim 2, wherein, the step of the setting routing information of at least two tunnels by a double-ascription PE of a remote CE comprises:

the double-ascription PE of the remote CE setting optimal routing information and suboptimal routing information of the tunnels in the route forwarding table according to pre-configured matching strategies.

4. (Previously presented) The method according to Claim 3, wherein, the procedure of setting a suboptimal routing information in the route forwarding table is:

setting the suboptimal routing information in the forwarding item of the optimal routing information in the route forwarding table.

5. (Previously presented) The method according to Claim 2, wherein, the step of detecting tunnel states to obtain the state information of the at least two tunnels comprises:

when a control layer of the double-ascription PE of the remote CE determines that some changes take place in the state of the outer layer tunnel of one of the at least two tunnels according to Bidirectional Forwarding Detection (BFD) or tunnel fast convergence techniques, advertising the available/unavailable state information of the tunnel to the forwarding engine.

6. (Previously presented) The method according to Claim 5, wherein, there is a tunnel state field in the forwarding table of the forwarding engine; and

the step of advertising the available/unavailable state information of the outer layer tunnel of one of the at least two tunnels to the forwarding engine comprises:

the double-ascription PE of the remote CE advertising the available/unavailable state information of the outer layer tunnel of one of the at least two tunnels to the route forwarding table of the forwarding engine, and updating the content of state field of the corresponding item.

7. (Previously presented) The method according to Claim 5, wherein, the step of advertising the available/unavailable state information of the outer layer tunnel of one of the at least two tunnels to the forwarding engine comprises:

the double-ascription PE of the remote CE advertising the available/unavailable state information of the outer layer tunnel of one of the at least two tunnels to an independent storage unit of the forwarding engine, and updating the state information wherein.

8. (Previously presented) The method according to Claim 5, wherein, the at least two tunnels comprise: a primary tunnel and at least one backup tunnel which are mutual backup tunnels; and

the step of the double-ascription PE of the remote CE selecting one or more available tunnels according to the state of each tunnel from the at least two tunnels comprises:

when the double-ascription PE of the remote CE needs to forward the service to the remote CE through the primary tunnel, it obtaining and judging the state information of the primary tunnel;

if the primary tunnel is available, the primary tunnel is selected as an available tunnel;

if the primary tunnel is unavailable, the at least one backup tunnel is selected as an available tunnel.

9. (Previously presented) The method according to Claim 8, further comprising: before forwarding the service to the remote CE through the backup tunnel, obtaining the state information of the backup tunnel and confirming that the state information of the backup tunnel is available.

10. (Previously presented) The method according to Claim 5, wherein, the at least two tunnels comprise: the at least two tunnels which are mutual load sharers; and

the step of the double-ascription PE of the remote CE selecting one or more available tunnels according to the state of each tunnel from the at least two tunnels and forwarding service according to the routing information of the available tunnels selected comprises:

when the double-ascription PE of the remote CE needs to forward the service to the remote CE through the mutual load sharing tunnels, if it is determined that one of the tunnels is unavailable while others are available according to the state information of the mutual load sharing tunnels, it forwards the service to the remote CE through the available tunnel.

11. (Currently amended) A Provider Edge (PE) equipment for fast converging an end-to-end service, comprising:

a storage module[[]];

a tunnel state detecting module; and

a forwarding module[[]], wherein[[]];

the PE is a double-ascription PE of a remote Customer Edge (CE) and is connected with a nearby CE;

the storage module is configured to store routing information and tunnel state information for each of at least two tunnels, before the nearby CE visits the remote CE,

wherein, ~~an originate node of the tunnels is~~ the double-ascription PE connected with the nearby CE serves as an initial node of each of the at least two tunnels itself, and a terminal node of each of the tunnels is a at least two other PEs connected with the remote CE serve as terminal nodes of the at least two tunnels, PE connected with the remote CE respectively, and

wherein the routing information and tunnel state information for each of the at least two tunnels are stored in one route forwarding table in an IP network[[: and]],

the tunnel state detecting module is configured to detect tunnel states of the at least two tunnels and update the tunnel state information stored in the storing module when the tunnel state is changed[[:]], and

the forwarding module is configured to select one or more available tunnels according to the state of each tunnel from the at least two tunnels stored in the storing module and forward service according to the routing information of the available tunnels selected.

12. (Previously presented) The method according to Claim 6, wherein, the at least two tunnels comprise: a primary tunnel and at least one backup tunnel which are mutual backup tunnels; and

the step of the double-ascription PE of the remote CE selecting one or more available tunnels according to the state of each tunnel from the at least two tunnels comprises:

when the double-ascription PE of the remote CE needs to forward the service to the remote CE through the primary tunnel, it obtaining and judging the state information of the primary tunnel;

if the primary tunnel is available, the primary tunnel is selected as an available tunnel;

if the primary tunnel is unavailable, the at least one backup tunnel is selected as an available tunnel.

13. (Previously presented) The method according to Claim 7, wherein, the at least two tunnels comprise: a primary tunnel and at least one backup tunnel which are mutual backup tunnels; and

the step of the double-ascription PE of the remote CE selecting one or more available tunnels according to the state of each tunnel from the at least two tunnels comprises:

when the double-ascription PE of the remote CE needs to forward the service to the remote CE through the primary tunnel, it obtaining and judging the state information of the primary tunnel;

if the primary tunnel is available, the primary tunnel is selected as an available tunnel;

if the primary tunnel is unavailable, the at least one backup tunnel is selected as an available tunnel.

14. (Previously presented) The method according to Claim 6, further comprising: before forwarding the service to the remote CE through the backup tunnel, obtaining the state information of the backup tunnel and confirming that the state information of the backup tunnel is available.

15. (Previously presented) The method according to Claim 7, further comprising: before forwarding the service to the remote CE through the backup tunnel, obtaining the state information of the backup tunnel and confirming that the state information of the backup tunnel is available.

16. (Previously presented) The method according to Claim 6, wherein, the at least two tunnels are mutual load sharers; and

the step of the double-ascription PE of the remote CE selecting one or more available tunnels according to the state of each tunnel from the at least two tunnels and forwarding service according to the routing information of the available tunnels selected comprises:

when the double-ascription PE of the remote CE needs to forward the service to the remote CE through the mutual load sharing tunnels, if it is determined that one of the tunnels is unavailable while others are available according to the state information of the mutual load sharing tunnels, it forwards the service to the remote CE through the available tunnel.

17. (Previously presented) The method according to Claim 7, wherein, the at least two tunnels are mutual load sharers; and

the step of the double-ascription PE of the remote CE selecting one or more available tunnels according to the state of each tunnel from the at least two tunnels and forwarding service according to the routing information of the available tunnels selected comprises:

when the double-ascription PE of the remote CE needs to forward the service to the remote CE through the mutual load sharing tunnels, if it is determined that one of the tunnels is unavailable while others are available according to the state information of the mutual load sharing tunnels, it forwards the service to the remote CE through the available tunnel.